In the Claims:

1. (Currently amended) A method for reducing diffusion of dopant ions from a doped dielectric layer into a metal layer, consisting of:

    (a) providing a substrate with a layer of undoped oxide dielectric material thereon;

    (b) depositing on said layer of undoped oxide, a metal layer;

    ~~(a)~~ (c) depositing directly on said metal layer, a single diffusion barrier, consisting of a layer of metal nitride; and then;

    ~~(b)~~ (d) depositing a layer of doped dielectric material on said diffusion barrier, wherein said diffusion barrier prevents direct contact of said doped dielectric layer with said metal layer.

2. (Previously withdrawn)

3. (Currently amended) A method for reducing diffusion of dopant ions from a doped dielectric layer into a metal layer, consisting of:

    (a) providing a substrate with a layer of undoped oxide dielectric material thereon;

    (b) depositing on said layer of undoped oxide, a metal layer;

    ~~(a)~~ (c) depositing directly on said metal layer, a single diffusion barrier, consisting of a layer of metal nitride; and then;

    ~~(b)~~ (d) depositing a layer of doped dielectric material on said diffusion barrier, wherein said diffusion barrier prevents direct contact of said doped dielectric layer with said metal layer.

4. (Previously amended) The method of claim 1, wherein said diffusion barrier has a thickness in the range of about 10 Åto about 1000 Å.

5. (Previously amended) The method of claim 1, wherein said diffusion barrier has a thickness in the

range of about 50 Å to about 350 Å.

6. (Previously amended) The method of claim 1, wherein said diffusion barrier has a thickness of about 100 Å.

7. (Previously amended) The method of claim 1, wherein said diffusion barrier is formed using a nitrogen rich radiofrequency (rf) plasma.

8. (Previously amended) The method of claim 7, wherein the radiofrequency plasma is formed using hydrogen and nitrogen gases having a ratio in the range of about 0.1:1 to about 4:1.

9. (Previously amended) The method of claim 7, wherein the radiofrequency plasma is formed using hydrogen and nitrogen gases having a ratio in the range of about 0.5:1 to about 2:1.

10. (Previously amended) The method of claim 7, wherein the radiofrequency plasma is formed using hydrogen and nitrogen gases having a ratio of about 3:2.

11. (Original) The method of claim 7, wherein the rf plasma power is in the range of about 100 Watts per 8 inch wafer to about 1000 Watts per 8 inch diameter wafer.

12. (Original) The method of claim 7, wherein the rf plasma power is in the range of about 400 Watts per 8 inch wafer to about 800 Watts per 8 inch diameter wafer.

13. (Original) The method of claim 5, wherein the rf plasma power is about 750 Watts per 8 inch wafer.

14. (Original) The method of claim 7, wherein the rf plasma is generated in the presence of a noble gas.

15. (Original) The method of claim 14, wherein said noble gas is selected from the group consisting of helium, neon, argon, krypton and xenon.

16. (Original) The method of claim 7, wherein the pressure in the plasma chamber is in the range of about 100 milliTorr to about 50 Torr.

17. (Original) The method of claim 7, wherein the pressure in the plasma chamber is in the range of

about 1 Torr to about 10 Torr.

18. (Original) The method of claim 7, wherein the pressure in the plasma chamber is about 4 Torr.

19. (Original) The method of claim 1, wherein the step of depositing a layer of doped dielectric material is carried out at a deposition temperature in the range of about 200° C to about 450° C.

20. (Original) The method of claim 1, wherein said doped dielectric layer is selected from the group consisting of fluorine doped silicate glass (FSG), phosphorous doped silicate glass (PSG), boron doped silicate glass (BSG), and boron phosphorous doped silicate glass (BPSG).

21. (Previously amended) The method of claim 1, wherein said metal nitride layer comprises a metal selected from the group consisting of aluminum, tantalum, and titanium.

22. (Currently amended) A method for reducing diffusion of dopant ions from a doped dielectric layer into a metal layer, consisting of:

(a) providing a substrate with a layer of undoped oxide dielectric material thereon;

(b) depositing on said layer of undoped oxide, a metal layer;

~~(a)~~ (c) depositing directly on said metal layer, a single nitrogen rich metal nitride layer; and then;

~~(b)~~ (d) depositing a layer of doped dielectric material on said nitrogen rich metal nitride layer, wherein said metal nitride layer prevents direct contact of said doped dielectric layer with said metal layer.

23. (Original) The method of claim 22, wherein said diffusion barrier is made using a radiofrequency (rf) method using at least one variable selected from (a) a hydrogen:nitrogen ratio in the range of about 0.1:1 to about 4:1, (b) an rf power in the range of about 100 Watts per 8 inch wafer to about 1000 Watts per 8 inch diameter wafer, (c) a pressure in the plasma chamber in the range of about 100 milliTorr to about 50 Torr, and (d) a deposition temperature in the range of about 200° C to about 450°C.

24. (Previously withdrawn)

25. (Currently amended) A method for reducing diffusion of dopant ions from a dielectric layer into a metal layer, consisting of:

(a) providing a substrate having a layer of undoped oxide dielectric thereon;

(b) depositing over said substrate, a metal layer from the group consisting of aluminum, titanium, tantalum and aluminum/tantalum;

(c) forming a single layer of metal nitride directly on said metal layer using a nitrogen rich plasma using at least one variable selected from the group consisting of:

(i) a hydrogen:nitrogen ratio in the range of about 0.1:1 to about 4:1;

(ii) an rf power in the range of about 100 Watts per 8 inch wafer to about 1000 Watts per 8 inch diameter wafer;

(iii) a pressure in the plasma chamber in the range of about 100 milliTorr to about 50 Torr; and a deposition temperature in the range of about 200° C to about 450° C; and

(d) depositing on said diffusion barrier, a layer of doped dielectric material selected from the group consisting of fluorine doped silicate glass (FSG), phosphorous doped silicate glass (PSG), boron doped silicate glass (BSG), and boron phosphorous doped silicate glass (BPSG), wherein said metal nitride prevents contact of said doped dielectric layer with said metal layer.

29. (Previously amended) The method of claim 1, wherein said barrier layer is formed using electromagnetic radiation.

30. (Previously amended) The method of claim 1, wherein said barrier layer is formed using nitrogen ion implantation.

48. (Currently amended) A method for reducing diffusion of dopant ions from a doped dielectric layer into a metal layer of a device stack having a layer of undoped oxide dielectric thereon and a metal layer on said layer of oxide, consisting of:

(a) forming a trench in said device stack, said trench having at least one sidewall;

(b) depositing on at least one sidewall, a single diffusion barrier, wherein said diffusion barrier is a layer of aluminum nitride; and then

(c) depositing a layer of doped dielectric material on said diffusion barrier within said trench, wherein said diffusion barrier prevents direct contact of said doped dielectric layer with said metal layer.

49. (Currently amended) A method for reducing diffusion of dopant ions from a doped dielectric layer into a metal layer of a device stack having a layer of undoped oxide dielectric thereon and a metal layer on said layer of oxide metal layer, consisting of:

(a) forming a trench in said device stack, said trench having at least one sidewall;

(b) depositing on at least one sidewall, a single diffusion barrier, wherein said diffusion barrier is a layer of tantalum nitride; and then

(c) depositing a layer of doped dielectric material on said diffusion barrier within said trench, wherein said diffusion barrier prevents direct contact of said doped dielectric layer with said metal layer.

50. (Currently amended) A method for reducing diffusion of dopant ions from a doped dielectric layer into a metal layer of a device stack having a layer of undoped oxide dielectric thereon and a metal layer on said layer of oxide metal layer, consisting of:

(a) forming a trench in said device stack, said trench having at least one sidewall;

(b) depositing on at least one sidewall, a single diffusion barrier, wherein said diffusion barrier is a layer of titanium nitride; and then

(c) depositing a layer of doped dielectric material on said diffusion barrier within said trench, wherein said diffusion barrier prevents direct contact of said doped dielectric layer with said metal layer.